REMARKS

Status

Claims 1-3, 8, 10, 12, 13, 21, 30, 31, 68 and 71 were at issue in this Office Action. The present response does not add or cancel any claims, and accordingly it is claims 1-3, 8, 10, 12, 13, 21, 30, 31, 68 and 71, as presently amended, which are the subject of this response.

The Office Action

In the Office Action mailed November 3, 2009, the Examiner maintained the rejection of claims 1-3, 8, 10, 13, 30, 31, 68 and 71, previously made under 35 U.S.C. §103 in view of U.S. Patent 6,730,471 of Katerkamp. The Examiner also maintained the rejection of claims 1-3, 8, 10, 12, 13, 21, 30, 31, 68 and 71 previously made under 35 U.S.C. §103 in view of the combination of Katerkamp and U.S. Patent 5,652,142 of Barker.

Applicant thanks the Examiner for the Office Action and for the thorough explanation of the basis for the maintenance of the rejections.

The Present Invention

As detailed in Applicant's prior response, which is incorporated herein by reference, the present invention provides an analytical device for non-invasively measuring the metabolic rate of a substantially spherical metabolizing particle such as a cell or group of cells. It is a notable feature of the present invention that the device incorporates a compartment which contains a medium which supports the growth of the metabolizing particle. The compartment is at least partially defined by a diffusion barrier which permits the passage of oxygen therethrough. The compartment is configured to have a high aspect ratio insofar as the height of the compartment is greater than the transverse dimension of the compartment. This configuration of the compartment assures that turbulent flow of the medium does not occur so that transport of

oxygen or another metabolite from the permeable membrane to the metabolizing particle occurs solely by diffusion. As detailed in the prior response, and as is shown in the present application with regard to Figures 1 and 4, the diffusion gradient manifests itself in the form of a **linear metabolite diffusion gradient**.

As will be explained hereinbelow, the prior art does not show any type of system or device in which a linear diffusion gradient is established.

The Present Invention is Patentable over the Prior Art

In the present Office Action the Examiner maintained the previously made rejection of all pending claims as being obvious in view of the Katerkamp patent taken either alone or in combination with the Barker patent. Applicant respectfully submits that the cited prior art does not show or suggest any device which (1) is structured in accord with the claims as now amended, nor does it show any device which (2) is configured and operative so as to establish a linear diffusion gradient.

The Katerkamp patent shows a system for monitoring the metabolic activity of cell cultures; however, this device is not configured in accord with the presently claimed invention and cannot operate to establish a linear oxygen gradient within a culture medium. The device of Katerkamp is based upon a modification of a microwell plate by the inclusion of a covering membrane and oxygen sensors. The individual wells of the plate are relatively shallow insofar as their height dimension is significantly less than their transverse width. As is shown in the Katerkamp patent, for example at Figures 2 and 6, the oxygen gradient established therein is not at all linear, and this is to be expected since significant convection will occur in the relatively wide and shallow container of culture medium. It is significant that Katerkamp nowhere discusses, or even uses, the term "diffusion gradient". Clearly, while Katerkamp does discuss a

concentration gradient with regard to oxygen levels, this gradient is not created solely by diffusion, and as a result is not a linear gradient in accord with Applicant's claimed invention.

In response to the prior Office Action, Applicant distinguished the present invention from Katerkamp with regard to the fact that the apparatus of Katerkamp does not produce a linear diffusion gradient of oxygen or other metabolite. In the present Office Action, the Examiner addressed Applicant's prior remarks and held that Katerkamp meets all of the structural limitations of the claims at issue, and in that regard did not give any patentable consideration to claim language specifying that Applicant's device produces a diffusion based metabolite gradient.

In response to the Examiner's remarks, Applicant has added a further structural limitation to the claims at issue specifying that the height dimension of the compartment is larger than its transverse dimension. As such, the claims recite a chamber which has a high aspect ratio, and such a chamber is shown in the application as originally filed, for example at Figure 1. As detailed in the specification, a chamber thus configured prevents turbulent mixing of the medium and assures that all transport of a metabolite will be solely by diffusion which is manifest in the fact that the diffusion gradient is linear. The Katerkamp patent, as discussed above, does not show any such chamber. In fact, the teaching of Katerkamp is directly opposite insofar as the system thereof utilizes relatively wide and shallow chambers for the containment of the culture medium. Therefore, all teaching in Katerkamp is directly away from the chamber of the present invention.

In view of these amendments and remarks, Applicant respectfully submits that the claims at issue now all recite a device which is structurally different from that of Katerkamp and which,

as a consequence, achieves results not shown or possible in Katerkamp. In view thereof, all rejections based upon Katerkamp are overcome.

A second group of rejections under 35 U.S.C. §103 was based upon the combination of Katerkamp and Barker. The Barker patent was cited for its teaching of an insert used in a cell culturing system, which insert may be positionable and repositionable within a culture well so as to allow cells to be grown on both sides of the insert. As such, Barker was specifically cited for its teaching with regard to those embodiments of the present invention wherein an insert may be used for adjusting the dimensions of a culture well. The Barker patent, like the Katerkamp patent, shows a compartment in which the transverse dimension of that compartment is greater than its height; this is in contrast to the presently amended claims which specifically recite that the height dimension of the chamber is greater than its transverse dimension. It is further notable that nowhere does Barker teach the establishment of any concentration gradient, much less a linear, diffusion based gradient as detailed in the claims at issue. In view of the foregoing, Applicant respectfully submits that the claims at issue all define subject matter patentable over the Barker patent taken either singly or in combination with the teaching of Katerkamp.

Conclusion

By the present amendment, the claims have been revised to specifically include structural limitations neither shown nor suggested in the prior art. As detailed herein, these structural features of the present invention function to establish a concentration gradient of oxygen or other metabolite which is based solely on diffusion and is hence a linear gradient. The prior art does not show or suggest any system which operates to provide a diffusion based gradient. The Katerkamp prior art produces a gradient which is clearly nonlinear and not solely diffusion based, while the Barker prior art does not teach any gradient at all.

The application is in condition for allowance. Any questions, comments, or suggestions which the Examiner may have which will place the application in still better condition for allowance should be directed to the undersigned attorney.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 07-1180.

Dated:

Respectfully submitted,

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